CLAIMS

What is claimed is:

1. A system for predicting a maintenance schedule and costs of future service events of a product, comprising:

a scheduler that determines a list of future service events for the product;

a simulator that simulates each of the listed future service events for the product to determine a cost; and

an aggregator that accumulates the list of future service events and the associated cost to formulate the predicted future maintenance schedule and costs.

2. The system according to claim 1, wherein the scheduler sequences the timing of the future service events according to occurrence.

3. The system according to claim 1, further comprising a scheduler adjuster that adjusts the schedule of the listed service events.

4. The system according to claim 1, wherein the simulator determines parts that have to be replaced for each future service event.

5. The system according to claim 1, wherein the simulator determines the availability of any spare parts needed for the future service events.

6. The system according to claim 1, wherein the simulator schedules the replacement of required parts for the future service events.

7. The system according to claim 1, wherein the simulator estimates the risks associated with each of the future service events.

8. The system according to claim 1, wherein the aggregator further comprises a cost aggregator that aggregates the total cost associated with the future service events.

9. A system for predicting a maintenance schedule and costs of future service events of a product serviced under a service agreement having a term, comprising:

a scheduler that determines a list of future service events for a predetermined time period based on operating conditions and design limit data, the operating conditions corresponding to the predetermined time period, the design limit data corresponding to each part in the product;

a simulator that determines the cost associated with each of the future service events; and

an aggregator that aggregates the future service events and the costs, the future service events aggregated into the maintenance schedule and the costs of the future service events aggregated into a total cost representative of fulfilling the service agreement.

10. The system of claim 9, further comprising:

the design limit data including an operating time design limit for each part of the product; and

wherein the scheduler:

calculates an operating time for each part in the product for the predetermined time period based on the corresponding operating conditions;

determines whether the calculated operating time exceeds the operating time design limit for each part of the product; and

schedules a maintenance event if the calculated operating time exceeds the operating time design limit for any part in the product.

11. The system of claim 10, wherein the scheduler further:

adds the calculated operating time for each part of the product to a cumulative calculated operating time for each part of the product, the cumulative calculated operating time for each part corresponding to a sum of the calculated operating times since a last scheduled maintenance event for the part;

determines whether the cumulative calculated operating time exceeds the operating time design limit for each part of the product; and

schedules a maintenance event if the cumulative calculated operating time exceeds the operating time design limit for any part of the product.

12. The system of claim 10, further comprising:

the predetermined time period comprising the term of the service agreement;

the operating conditions including a plurality of sets of operating conditions corresponding to a plurality of sets of time periods within the predetermined time period; and

wherein the scheduler:

determines the calculated operating time and the cumulative calculated operating time limit for each part of the product for each of the plurality of sets of operating conditions; and

schedules a maintenance event if the calculated operating time or the cumulative calculated operating time exceeds the operating time design limit for any part of the product.

13. The system of claim 9, wherein the scheduler further determines a parts cost associated with each scheduled service event.

14. The system of claim 9, wherein the scheduler further determines a parts risk associated with each scheduled service event.

15. The system of claim 9, wherein the scheduler further determines a service cost associated with each scheduled service event.

16. The system of claim 9, wherein the scheduler further determines a service risk associated with each scheduled service event.

17. The system of claim 9, wherein the simulator further:

determines a list of parts to be replaced for each of the future service events;

determines a list of services to be performed for each of the future service events;

determines a part cost for each of the parts to be replaced for each of the future service events; and

determines a service cost for each of the of services to be performed for each of the future service events.

18. The system of claim 9, wherein the simulator further:

retrieves a previously-stored part cost associated with each of the parts to be replaced; and

retrieves a previously-stored service cost associated with each of the services to be performed.

19. The system of claim 9, wherein the simulator further:

determines a list of parts to be replaced for each of the future service events;

determines a list of services to be performed for each of the future service events;

determines a part risk for each of the parts to be replaced for each of the future service events; and

determines a service risk for each of the of services to be performed for each of the future service events.

20. The system of claim 19, wherein the simulator further:

retrieves a previously-stored part risk associated with each of the parts to be replaced; and

retrieves a previously-stored service risk associated with each of the services to be performed.

21. The system of claim 9, wherein the simulator further:

determines a list of parts to be replaced for each of the future service events;

determines a list of services to be performed for each of the future service events;

determines a part cost and a part risk for each of the parts to be replaced for each of the future service events; and

determines a service cost and a service risk for each of the of services to be performed for each of the future service events.

22. The system of claim 21, wherein the simulator further:

retrieves a previously-stored part cost and part risk, respectively, associated with each of the parts to be replaced; and

retrieves a previously-stored service cost and service risk, respectively, associated with each of the services to be performed.

23. The system of claim 9, wherein the simulator further:

determines a list of parts to be replaced for each of the future service events;

determines the availability of each of the parts to be replaced.

24. The system of claim 23, wherein the simulator further searches a predetermined inventory pool.

25. The system of claim 24, wherein the predetermined inventory pool comprises one of a private inventory pool associated exclusively with the service agreement, a common inventory pool associated with a plurality of service agreements, a refurbished parts inventory pool, and a new parts inventory pool.

26. The system of claim 23, wherein the simulator further searches a plurality of inventory pools in a predetermined order.

27. The system of claim 23, wherein the simulator further determines if a new part can be purchased.

28. The system of claim 9, wherein the simulator further determines a fee for each of the future service events.

29. A method for predicting a maintenance schedule and costs of future service events of a product, comprising:

determining a list of future service events for the product;

simulating each of the listed future service events for the product; and

aggregating the maintenance schedule and costs associated with the events.

30. The method according to claim 29, wherein the simulating comprises sequencing the timing of the future service events according to occurrence.

31. The method according to claim 29, further comprising adjusting the schedule of the listed service events.

32. The method according to claim 29, wherein the simulating comprises determining parts that have to be replaced for each future service event.

33. The method according to claim 29, wherein the simulating comprises determining the availability of any spare parts needed for the future service events.

34. The method according to claim 29, wherein the simulating comprises scheduling the replacement of required parts for the future service events.

35. The method according to claim 29, wherein the simulating comprises estimating the risks associated with each of the future service events.

36. The method according to claim 29, where aggregating further comprises aggregating the total cost associated with the future service events.

37. A method for predicting a maintenance schedule and costs of future service events of a product serviced under a service agreement having a term, comprising:

determining a list of future service events for a predetermined time period based on operating conditions and design limit data, the operating conditions corresponding to the predetermined time period, the design limit data corresponding to each part in the product;

determining the cost associated with each of the future service events; and

aggregating the maintenance schedule and cost of the future service events, the maintenance schedule comprising the aggregated list of future events and the costs aggregated into a total cost representative of fulfilling the service agreement.

38. The method of claim 37, where determining the list of future service events further comprises:

the design limit data including an operating time design limit for each part of the product;

calculating an operating time for each part in the product for the predetermined time period based on the corresponding operating conditions;

determining whether the calculated operating time exceeds the operating time design limit for each part of the product; and

scheduling a maintenance event if the calculated operating time exceeds the operating time design limit for any part in the product.

39. The method of claim 38, where determining the list of future service events further comprises:

adding the calculated operating time for each part of the product to a cumulative calculated operating time for each part of the product, the cumulative calculated operating time for each part corresponding to a sum of the calculated operating times since a last scheduled maintenance event for the part;

determining whether the cumulative calculated operating time exceeds the operating time design limit for each part of the product; and

scheduling a maintenance event if the cumulative calculated operating time exceeds the operating time design limit for any part of the product.

40. The method of claim 38, where determining the list of future service events further comprises:

the predetermined time period comprising the term of the service agreement;

the operating conditions including a plurality of sets of operating conditions corresponding to a plurality of sets of time periods within the predetermined time period;

determining the calculated operating time and the cumulative calculated operating time limit for each part of the product for each of the plurality of sets of operating conditions; and

scheduling a maintenance event if the calculated operating time or the cumulative calculated operating time exceeds the operating time design limit for any part of the product.

41. The method of claim 37, where determining the cost associated with each of the future service events further comprises determining a parts cost associated with each scheduled service event.

42. The method of claim 37, where determining the cost associated with each of the future service events further comprises determining a parts risk associated with each scheduled service event.

43. The method of claim 37, where determining the cost associated with each of the future service events further comprises determining a service cost associated with each scheduled service event.

44. The method of claim 37, where determining the cost associated with each of the future service events further comprises determining a service risk associated with each scheduled service event.

45. The method of claim 37, where determining the cost associated with each of the future service events further comprises simulating each of the future service events for the product.

46. The method of claim 45, where simulating each of the future service events for the product further comprises:

determining a list of parts to be replaced for each of the future service events;

determining a list of services to be performed for each of the future service events;

determining a part cost for each of the parts to be replaced for each of the future service events; and

determining a service cost for each of the of services to be performed for each of the future service events.

47. The method of claim 46, where determining the part cost and the service cost, respectively, further comprises:

retrieving a previously-stored part cost associated with each of the parts to be replaced; and

retrieving a previously-stored service cost associated with each of the services to be performed.

48. The method of claim 45, where simulating each of the future service events for the product further comprises:

determining a list of parts to be replaced for each of the future service events;

determining a list of services to be performed for each of the future service events;

determining a part risk for each of the parts to be replaced for each of the future service events; and

determining a service risk for each of the of services to be performed for each of the future service events.

49. The method of claim 48, where determining the part risk and the service risk, respectively, further comprises:

retrieving a previously-stored part risk associated with each of the parts to be replaced; and

retrieving a previously-stored service risk associated with each of the services to be performed.

50. The method of claim 45, where simulating each of the future service events for the product further comprises:

determining a list of parts to be replaced for each of the future service events;

determining a list of services to be performed for each of the future service events;

determining a part cost and a part risk for each of the parts to be replaced for each of the future service events; and

determining a service cost and a service risk for each of the of services to be performed for each of the future service events.

51. The method of claim 50, where determining the part cost, the part risk, the service cost, the service risk, respectively, further comprises:

retrieving a previously-stored part cost and part risk, respectively, associated with each of the parts to be replaced; and

retrieving a previously-stored service cost and service risk, respectively, associated with each of the services to be performed.

52. The method of claim 45, where simulating each of the future service events for the product further comprises:

determining a list of parts to be replaced for each of the future service events;

determining the availability of each of the parts to be replaced.

53. The method of claim 52, where determining the availability of each of the parts to be replaced further comprises searching a predetermined inventory pool.

54. The method of claim 53, where the predetermined inventory pool comprises one of a private inventory pool associated exclusively with the service agreement, a common inventory pool associated with a plurality of service agreements, a refurbished parts inventory pool, and a new parts inventory pool.

55. The method of claim 52, where determining the availability of each of the parts to be replaced further comprises searching a plurality of inventory pools in a predetermined order.

56. The method of claim 52, where determining the availability of each of the parts to be replaced further comprises determining if a new part can be purchased.

57. The method of claim 37, where determining the cost associated with each of the future service events further comprises determining a fee for each of the future service events.

58. A computer-readable medium storing computer instructions for instructing a computer system to predict a maintenance schedule and costs of future service events of a product, the computer instructions comprising:

determining a list of future service events for the product;

simulating each of the listed future service events for the product; and

aggregating the costs associated with the events.

59. The computer-readable medium according to claim 58, wherein the simulating instructions comprise sequencing the timing of the future service events according to occurrence.

60. The computer-readable medium according to claim 58, further comprising instructions for adjusting the schedule of the listed service events.

61. The computer-readable medium according to claim 58, wherein the simulating instructions comprise determining parts that have to be replaced for each future service event.

62. The computer-readable medium according to claim 58, wherein the simulating instructions comprise determining the availability of any spare parts needed for the future service events.

63. The computer-readable medium according to claim 58, wherein the simulating instructions comprise scheduling the replacement of required parts for the future service events.

64. The computer-readable medium according to claim 58, wherein the simulating instructions comprise estimating the risks associated with each of the future service events.

65. The computer-readable medium according to claim 58, where the aggregating instructions further comprise instructions for aggregating the total cost associated with the future service events.

66. A computer-readable medium storing computer instructions for instructing a computer system to predict a maintenance schedule and costs of future service events of a product, the computer instructions comprising:

determining a list of future service events for a predetermined time period based on operating conditions and design limit data, the operating conditions corresponding to the predetermined time period, the design limit data corresponding to each part in the product;

determining the cost associated with each of the future service events; and

aggregating the cost of the future service events into a total cost representative of fulfilling the service agreement.

67. The method of claim 66, where the instructions determining the list of future service events further comprise:

the design limit data including an operating time design limit for each part of the product;

calculating an operating time for each part in the product for the predetermined time period based on the corresponding operating conditions;

determining whether the calculated operating time exceeds the operating time design limit for each part of the product; and

scheduling a maintenance event if the calculated operating time exceeds the operating time design limit for any part in the product.

68. The computer-readable medium of claim 67, where the instructions for determining the list of future service events further comprise:

adding the calculated operating time for each part of the product to a cumulative calculated operating time for each part of the product, the cumulative calculated operating time for each part corresponding to a sum of the calculated operating times since a last scheduled maintenance event for the part;

determining whether the cumulative calculated operating time exceeds the operating time design limit for each part of the product; and

scheduling a maintenance event if the cumulative calculated operating time exceeds the operating time design limit for any part of the product.

69. The computer-readable medium of claim 67, where the instructions for determining the list of future service events further comprise:

the predetermined time period comprising the term of the service agreement;

the operating conditions including a plurality of sets of operating conditions corresponding to a plurality of sets of time periods within the predetermined time period;

determining the calculated operating time and the cumulative calculated operating time limit for each part of the product for each of the plurality of sets of operating conditions; and

scheduling a maintenance event if the calculated operating time or the cumulative calculated operating time exceeds the operating time design limit for any part of the product.

70. The computer-readable medium of claim 66, where the instructions for determining the cost associated with each of the future service events further comprise determining a parts cost associated with each scheduled service event.

71. The computer-readable medium of claim 66, where the instructions for determining the cost associated with each of the future service events further comprises determining a parts risk associated with each scheduled service event.

72. The computer-readable medium of claim 66, where the instructions for determining the cost associated with each of the future service events further comprise determining a service cost associated with each scheduled service event.

73. The computer-readable medium of claim 66, where the instructions for determining the cost associated with each of the future service events further comprise determining a service risk associated with each scheduled service event.

74. The computer-readable medium of claim 66, where the instructions for determining the cost associated with each of the future service events further comprise simulating each of the future service events for the product.

75. The computer-readable medium of claim 74, where the simulating further comprise:

determining a list of parts to be replaced for each of the future service events;

determining a list of services to be performed for each of the future service events;

determining a part cost for each of the parts to be replaced for each of the future service events; and

determining a service cost for each of the of services to be performed for each of the future service events.

76. The computer-readable medium of claim 75, where the instructions for determining the part cost and the service cost, respectively, further comprise:

retrieving a previously-stored part cost associated with each of the parts to be replaced; and

retrieving a previously-stored service cost associated with each of the services to be performed.

77. The computer-readable medium of claim 74, where the instructions further comprise:

determining a list of parts to be replaced for each of the future service events;

determining a list of services to be performed for each of the future service events;

determining a part risk for each of the parts to be replaced for each of the future service events; and

determining a service risk for each of the of services to be performed for each of the future service events.

78. The computer-readable medium of claim 77, where the instructions for determining the part risk and the service risk, respectively, further comprise:

retrieving a previously-stored part risk associated with each of the parts to be replaced; and

retrieving a previously-stored service risk associated with each of the services to be performed.

79. The computer-readable medium of claim 74, where simulating instructions further comprise:

determining a list of parts to be replaced for each of the future service events;

determining a list of services to be performed for each of the future service events;

determining a part cost and a part risk for each of the parts to be replaced for each of the future service events; and

determining a service cost and a service risk for each of the of services to be performed for each of the future service events.

80. The computer-readable medium of claim 79, where the instructions for determining the part cost, the part risk, the service cost, the service risk, respectively, further comprise:

retrieving a previously-stored part cost and part risk, respectively, associated with each of the parts to be replaced; and

retrieving a previously-stored service cost and service risk, respectively, associated with each of the services to be performed.

81. The computer-readable medium of claim 74, where the simulating instructions further comprise:

determining a list of parts to be replaced for each of the future service events;

determining the availability of each of the parts to be replaced.

82. The computer-readable medium of claim 81, where the instructions for determining the availability of each of the parts to be replaced further comprise searching a predetermined inventory pool.

83. The computer-readable medium of claim 82, where the predetermined inventory pool comprises one of a private inventory pool associated exclusively with the service agreement, a common inventory pool associated with a plurality of service agreements, a refurbished parts inventory pool, and a new parts inventory pool.

84. The computer-readable medium of claim 82, where the instructions for determining the availability of each of the parts to be replaced further comprise searching a plurality of inventory pools in a predetermined order.

85. The computer-readable medium of claim 82, where the instructions for determining the availability of each of the parts to be replaced further comprise determining if a new part can be purchased.

86. The computer-readable medium of claim 66, where the instructions for determining the cost associated with each of the future service events further comprise determining a fee for each of the future service events.